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10/589,415	10/05/2006	Takatoshi Sakata	F-9180	8218

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EXAMINER	
MULLINS, BURTON S	

ART UNIT	PAPER NUMBER
2834	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/589,415	SAKATA ET AL.	
	Examiner	Art Unit	
	BURTON MULLINS	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 January 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2,3 and 5-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2,3 and 5-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 August 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. It is noted that applicant's list of claims submitted 05 January 2009 is improper because amended claim 3 lacks the proper status identifier as required by 37 CFR 1.121(c). Claim 3 is not an "original" claim but rather an amended claim, and should have been denoted as such.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the solid lubricant coating/s (claims 8 and 13) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will

be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claims 2, 8 and 13 are objected to because of the following informalities: In claim 2, line 8, change "engage" to –engaged--. Claims 8 and 13 have the same error. Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. Claims 2-3, and 5-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 2, 8 and 13, recitation "said pole teeth…having inner ends each respectively branching contiguously [sic] to form at least portions of a stator core inner-diameter surface of said stator" is indefinite because it is not clear if this means the pole teeth form a contiguous stator inner-diameter surface, or if it means inner ends are contiguous with their respective pole teeth, in which case the stator inner-diameter surface could or could not be contiguous. The recitation "portions" suggests the latter interpretation.

In claim 8, recitation "a solid lubricant coating film…formed adhered on one of said rotor core outer-diameter surface…" is not-idiomatic, redundant and of indefinite scope. If the film is 'formed' on the core surface, it by definition also 'adheres' thereto. Vice versa, if the film

'adheres' to the core surface, it by definition is also 'formed' thereon. Claim 13 has the same recitation.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 2-3 and 5-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakakibara et al. (US 7,156,623) in view of Nishiyama et al. (US 6,300,700) and Unjo et al. (US 4,659,952). Sakakibara teaches an electric pump unit, comprising: a housing having a first housing end, a second housing end, and an inner dividing wall dividing said housing into a pump section 11/15 and a motor section 12 and defining a shaft hole 13a (Fig.1); said pump section 11/15 being configured for drawing and discharging a fluid and disposed at said first housing end, said pump section housing a pump device (Fig.1); a rotating shaft 31 rotatably disposed in said shaft hole 13a and having a first end engage[d] with said pump device and a second end extended into said motor section; said motor section 12 comprising: a rotor fixed to said second end of said rotating shaft 31; said rotor including a rotor core material (yoke) 32 forming a rotor core outer-diameter surface extending in an axial direction (Fig.1), and forming first and second rotor ends extending substantially in a radial direction (not numbered, Fig.1); and a stator including a stator core material 35 and coils 34 disposed on said stator at a periphery of said rotor 32 (Fig.1).

Sakakibara does not teach: 1) stator teeth having said coils on radially extending stem portions; and having inner ends each respectively branching contiguously [sic] to form at least

portions of a stator core inner diameter surface of said stator. Further, Sakakibara teaches permanent magnets 33 but does not teach: 2) a rotor core material housing a permanent magnet such that said permanent magnet is not exposed at said first bearing surface, or 3) a first bearing surface wherein "said rotor core outer-diameter surface oppos[es] said stator core inner-diameter surface without intervening solid bearing parts to define a bearing gap between said rotor core outer-diameter surface and said stator core inner-diameter surface such that rotation of said rotation shall is supported by said stator core inner-diameter surface being in sliding contact with said rotor core outer-diameter surface."

Regarding features (1) and (2), Nishiyama teaches a motor for a pump (i.e., compressor, c.7:8) comprising a rotor 3 consisting of a rotor core 13 and a permanent magnet 14 which are fixed to an outer circumference of a rotation shaft 4 (Fig.1); and a stator 2 consisting of a stator core 22 having a teeth portion 7, and a coil 24 which are disposed in a periphery of said rotor (Figs.1&4), wherein said permanent magnet 14 constituting said rotor is embedded in said rotor core 13 (Fig.1). Each tooth 7 has ends 12a "branching contiguously" from their respective tooth 7 to form "at least portions of a stator core inner-diameter surface of said stator" (Fig.2). The teeth and windings generate the rotating magnetic field while embedding the magnets in the rotor core utilizes not only the magnet torque but also the reluctance torque (c.4:20-25; c.1:26-28). It would have been obvious to modify Sakakibara and provide stator teeth and an embedded magnet in the rotor core per Nishiyama to generate the rotating magnetic field and utilize reluctance torque.

Regarding (3), Unjo teaches a stepper motor air gap bearing comprising a rotor 2 and stator 8/9/10/11 coated with a layer 20 of plastic material having a lubricating property (c.2:38-

45), so that the rotor rotates within the stator while it is maintained in a closely adjacent relation slightly contactable with the coated layer 20 (c.1:65-69). Thus, this structure comprises "a rotor core outer-diameter surface extending in the axial direction and opposing a stator core inner-diameter surface without intervening solid bearing parts" (Fig.2), and further comprises a "first bearing surface" defined by a bearing gap between said rotor core outer-diameter surface and said stator core inner-diameter surface such that rotation of said rotation shaft is supported by said stator core inner-diameter surface being in sliding contact with said rotor core outer-diameter surface (c.2:59-65, c.3:14-17). The increased sliding surface of Unjo's air gap bearing thus elongates the operational life of the motor.

It would have been obvious to further modify Sakabibara and Nishiyama and provide a first bearing surface comprising a rotor core outer-diameter surface extending in the axial direction and opposing a stator core inner-diameter surface without intervening solid bearing parts as in Unjo since this would have increased the sliding surface of the air gap and elongated the operational life of the motor.

Regarding claim 3, Nishiyama's stator core has a stator core inner-diameter surface formed contiguously about an entire circumference thereof (i.e., when the gap d is set to zero there is no gap, c.5:50-54; Fig.2) so as to form an annular stator inner core having a cylindrical inner circumferential face forming said stator core inner-diameter surface; and pole teeth 7 protrude radially outward from an outer circumferential face of said annular stator inner core and are separated by gaps 81 at an outer periphery of said stator (Figs.7-8).

Regarding claim 5, Nishiyama's rotor comprises high permeability material of which laminated electromagnetic steel is a subset. Further, the examiner takes official notice that rare earth elements are notorious for use in rotor permanent magnets.

Regarding claim 6, in Nishiyama, the stator core has a stator core outer-diameter surface formed contiguously about an entire circumference thereof so as to forth an annular stator outer core 21 (Fig.1); and said pole teeth 7 protrude radially inward from said annular stator outer core and have circumferentially extending branches (sides) 12a that are separated by gaps and together form said stator core inner diameter surface as a discontinuous surface (Fig.2, c.5:40-50).

Regarding claim 7, Nishiyama's rotor comprises high permeability material of which laminated electromagnetic steel is a subset. Further, the examiner takes official notice that rare earth elements are notorious for use in rotor permanent magnets.

Regarding claim 8, the same grounds of rejection given for claim 2 above applies. Further, as best understood, in Nishiyama the pole teeth have inner ends 12a which respectively "branch contiguously" from respective teeth 7 to form "at least portions of a stator core inner-diameter surface of said stator". Further, Unjo's nonmagnetic coating layer 20 comprising fluorine resin with lubricating properties comprises applicant's claimed "solid lubricant coating film made of a non-magnetic material formed adhered [sic] on one of said rotor core outer-diameter surface or said stator core inner-diameter surface".

Regarding claim 9, Nishiyama's stator core has a stator core inner-diameter surface formed contiguously about an entire circumference thereof (i.e., when the gap d is set to zero there is no gap, c.5:50-54; Fig.2) so as to form an annular stator inner core having a cylindrical

inner circumferential face forming said stator core inner-diameter surface; and pole teeth 7 protrude radially outward from an outer circumferential face of said annular stator inner core and are separated by gaps 81 at an outer periphery of said stator (Figs.7-8).

Regarding claim 10, Nishiyama's rotor comprises high permeability material of which laminated electromagnetic steel is a subset. Further, the examiner takes official notice that rare earth elements are notorious for use in rotor permanent magnets.

Regarding claim 11, in Nishiyama, the stator core has a stator core outer-diameter surface formed contiguously about an entire circumference thereof so as to forth an annular stator outer core 21 (Fig.1); and said pole teeth 7 protrude radially inward from said annular stator outer core and have circumferentially extending branches (sides) 12a that are separated by gaps and together form said stator core inner diameter surface as a discontinuous surface (Fig.2, c.5:40-50).

Regarding claim 12, Nishiyama's rotor comprises high permeability material of which laminated electromagnetic steel is a subset. Further, the examiner takes official notice that rare earth elements are notorious for use in rotor permanent magnets.

Regarding claim 13, the same grounds of rejection given for claim 2 above applies. Further, as best understood, in Nishiyama the pole teeth have inner ends 12a which respectively "branch contiguously" from respective teeth 7 to form "at least portions of a stator core inner-diameter surface of said stator". Further, Unjo's nonmagnetic coating layer 20 comprising fluorine resin with lubricating properties comprises applicant's claimed "solid lubricant coating film made of a non-magnetic material formed adhered [sic] on one of said rotor core outer-diameter surface or said stator core inner-diameter surface". While the coating layer 20 is

described as being on the stator, not also the rotor, this would have been an obvious modification since it has been held that duplication and shifting of parts (i.e., duplication of the coating layer 20 such that it is on both the stator and the rotor) for multiplied effect involves ordinary skill. St.Regis Paper Co. v Bemis Co., Inc, 193 USPQ 8, 11 (7th Cir.1977); In re Japikse, 86 USPQ 70 (CCPA 1950).

Regarding claim 14, Nishiyama's stator core has a stator core inner-diameter surface formed contiguously about an entire circumference thereof (i.e., when the gap d is set to zero there is no gap, c.5:50-54; Fig.2) so as to form an annular stator inner core having a cylindrical inner circumferential face forming said stator core inner-diameter surface; and pole teeth 7 protrude radially outward from an outer circumferential face of said annular stator inner core and are separated by gaps 81 at an outer periphery of said stator (Figs.7-8).

Regarding claim 15, Nishiyama's rotor comprises high permeability material of which laminated electromagnetic steel is a subset. Further, the examiner takes official notice that rare earth elements are notorious for use in rotor permanent magnets.

Regarding claim 16, in Nishiyama, the stator core has a stator core outer-diameter surface formed contiguously about an entire circumference thereof so as to forth an annular stator outer core 21 (Fig.1); and said pole teeth 7 protrude radially inward from said annular stator outer core and have circumferentially extending branches (sides) 12a that are separated by gaps and together form said stator core inner diameter surface as a discontinuous surface (Fig.2, c.5:40-50).

Regarding claim 17, Nishiyama's rotor comprises high permeability material of which laminated electromagnetic steel is a subset. Further, the examiner takes official notice that rare earth elements are notorious for use in rotor permanent magnets.

Response to Arguments

7. Applicant's arguments with respect to claims 2-3 and 5-17 have been considered but are moot in view of the new ground(s) of rejection. Regarding applicant's comments concerning Nishiyama and the features of claim 3, it is noted that in addition to teaching a discontinuous core inner diameter surface (i.e., a gap 'd' exists between pole teeth ends, $0 < d < 0.2$ mm; Fig.2; c.5:40-49), Nishiyama also explicitly states that gap d "may be set to zero if the magnetic flux leak between adjacent core elements 5 can be ignored and there is no problem in assembling precision" (c.5:50-52). Thus, when d=0, there is no gap and the stator core inner-diameter surface is formed contiguously about an entire circumference thereof. A reference is valid for all it teaches, not just preferred embodiments.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BURTON MULLINS whose telephone number is (571)272-2029. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Q.Leung can be reached on (571)272-8188. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BURTON MULLINS/
Primary Examiner, Art Unit 2834

bsm
19 January 2009